

CGCCCGGGCAGGTCAGCCTGTCTCAAGGCACGCCAGTCTCAGCTCCGACCTTGACGCGGCACGCGGGGTGGGAGCGGGGAGGACGACGGGAA  
GAGCGGAGCGAGGACCCGGTCCGGCGCAGTCTTCAATGAGCAGCGGGAAACTGCACCCACAGACCCGAGCCTGCTGCGCGCCCCCTCCACAGAGCTC  
ACCTGGTGCCAGTAACAGGCCCTGCCCTGCGCCTGATGGCTTGCCCCCTGAGCTACAACTTGCCCTCAGCACCCGCCACCTCC  
AAACCAGCAGGAGCGGGCTGTGGAAGCGGTGGTGACTTTGGCCTTCATGAGTGGACATCTGCGTGACCACGGCCATCTATGTCTTCAGCCA  
CCTGGACCGCAGCCTCCTGGAGGACATCCGCCACTTCAACATCTTTGACTCGGTCTGGATCTCTGGGACGCTGCTGTACCGCAGCTGCCTGCT  
GCTGGGAGCCACCATTTGGTGTGGCCAAAGAACAGTCCGCTGGGGCCCCGGCGCTGCGGCTCGTGCTCATCACCCCTCGTGTGCCCTCTTCGT  
GGGCATCTATGCCATGTGAAGCTGCTCTTCTCAGAGGTGCGCAGGCCCATCCGGGACCCCTGGTTTGGGCCCTGTTGCTGTGGACGTACAT  
TTTCACTCGGGCATCCTTCTGCTGTGTGGCTGTGTCCACCGTGGGCCAGGCAACCAGGCCCTGGAGCCAGGGCGGCCACCGAGGCTGAGGG  
CTTCCCTGGGAGGGCCGCCACCGCCCGAGCAGGCGTCTGGGGCCACGCTGCAGAGCTGCTCTCCTACACCAAGCCCGACGTGGCCTTCCTCGT  
GGCCGCCCTCTTCTCCTCATCGTGGCAGCTCTGGGAGAGACCTTCTCGCCTACTACACGGCGCGGCCATTGATGGCATCGTCATCCAGAAAAG  
CATGGATCAGTTCAGCACGGCTGTGCTCATCGTGTGCCCTGCTGGCCATTGGCAGCTCATTTGCCGCAAGTATTGGGGCGGCATTTTACCCCTCAT  
ATTTGCCAGACTGAACATTCCGCTTCGAAACTGCTCTTCCGCTCACTGGTGTCCAGGAGACAAGCTTCTTTGATGAGAACCCGACAGGGGACCT  
CATCTCCCGCTGACCTCGGACACCACTGGTCAGCGACCTGGTCTCCAGAACATCAATGTCTTCTGCGGAACACAGTCAAGTCAAGGTCACGGGCGT  
GGGTGGTCTTCATGTTCAGCCTCTCATGGCAGCTCTCCTTGGTCACCTTCATGGGCTTCCCATCATCATGATGGTGTCCAACATCTACGGCAAGTA  
CTACAAGAGGCTCTCCAAGAGGTCAGAAATGCCCTGGCCAGAGCGAGCAACACGGCGGAGGAGACCATCAGTGCCATGAAGACTGTCCGGAGCTT  
CGCCAAATGAGGAGGAGGAGGAGGAGGTACCTGCGGAAGCTGCAGCAGGTGTACAAGCTGAACAGGAAGGAGGAGCTGCCATCATGTACTACGT  
CTGGGGCAGCGGGCTCACACTGCTGGTGGTCCAGGTTCAGATCTCTACTACGGGGCCACCTTGTCTCATCTCAGGCCAGATGACCGCGGCAACCT  
CATCGCCTTCATCATCTACGAGTTTGTCTGGAGATTGTATGGAGTCCGTGGGCTCCGTCTACAGTGGCCTGATGCAGGGAGTGGGGCTGCTGA  
GAAGGTGTTGAGTTTCATCGACCGGACCCGACCATGGTGACAGTGGCAGCTTGGCCCCCGACCACTGGAGGGCCGGGTGGACTTTGAGAAATGT  
GACCTTCACCTACCGCACTCGGCCCCACACCCAGGTCTCGAGAATGTCTCCTTCAGCCTGTCCCCGGCAAGGTGACGGCCCTGTTGGGGCCCCC  
GGGCAGTGGGAAGAGCTCCTGTGTCAACATCCTGGAGAACTTCTACCCCTGGAGGGGGCGGGTGTGCTGTGGACGGCAAGCCCATCAGCGCCTA  
CGACCCACAAGTACTTGACCCGTGTGATCTCCCTGGTGAGCCAGGACCCGCTGTGCTGCCCCGCTCCATCACGGATAACATCTCCTACGGCCTGCC  
CACTGTGCCCTTCGAGATGGTGGTGGAGGCCCGCACAGAAG[GCCAAATGCCACGGCTTCATCATGGAATCCAGGACGGCTACAGCACAGACAGACAG  
GGGAGAGGGGCCCACTGTACGTTGGCCAGAAGCAGCGGGTGGCCATGGCCCCGGCTCTGGTGGGAACCCCCAGTCTCATCTCCTGGATGAAG  
CCACCAAGCGCTTTGGATGCCGAGAGCGAGTATCTGATCCAGCAGGCCATCCATGGCAACCTGCAGAAGCACACGGTACTCATCTCGGCACCGGC  
TGAGCACCGTGGAGCACGCGCACTCATTTGTTGTTGGTGTGGACAAGGCCGCGTAGTGACAGGGCACCCACAGCAGTGTGTCGCCAGGGCGGC  
TCTACGCCAAGCTGTTGCAGCGGCAGATGCTGGGGCTTCAGCCC[GCCGCAAGCTTCACAGCTGGCCACAACGAGCCTGTAGCCCAACGGCAGTCACTC

**FIG. 1-1**

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AAGGCGCTGATGGGGGGCCCTGCTTCTCCGGTGGGGCAGAGGACCCGGTGCCCTGCCAGATGTGCCACGAGGCCCCCAGCTGCCCTCCGA  
GCCAGGCCTGCAGCACTGAAAGACGACCTGCCATGTCCCATGGATCACCGCTTCCCTGCATCTTGCCCCCTGGTCCCTGCCCATTTCCAGGGCACT  
CCTTACCCCTGCTGCCCTGAGCCAAAGCCCTTCACGGACCTCCCTAGCCTCCTAAGCAAAGGTAGAGCTGCCTTTTAAACCTAGGTCTTACCAGGG  
TTTTTACTGTTTGGTTGAGGCACCCAGTCAACTCCTAGATTCAAAAACCTTTTCTAATTGGAGTAATGSCGGGCACCTTTCACCAAGATGTT  
CTAGAAACTTCTAGCCAGGAGTGAATGGCCCTTCCCTTAGTAGCCTGGGGGATGTCCAGAGACTAGGCCCTCTCCCCCTTTACCCCTCCAGAGAAGGG  
GCTTCCCTGTCCCGGAGGACACGGGAACGGGATTTTCCGTCTCTCCCTCTTGCCAGCTCTGTGAGTCTGGCCAGGCGGGTAGGGAGCGTGGAG  
GGCATCTGTCTGCCATCGCCCGCTGCCAATCTAAGCCAGTCTCACTGTGAACACACGAAACCTCAACTGGGGAGTGAGGGCTGGCCAGGTCTG  
GAGGGCCCTCAGGGGTGCCCGAGCCCGGACCCAGCGCTTTCGCCCCCTCGTCCACCCACCCCTGGCTGGCAGCCTCCCTCCCCACACCCGCCCTGT  
GCTCTGCTGTGGAGGCCACGTGGATGTTTCATGAGATGCATTCTCTGTCTTGTGGATGGGATGGTGGCAAGCCCCAGGATCTGGCTTTGC  
CAGAGGTTGCAACATGTTGAGAGAACCCGGTCAATAAAGTGTAACCTCTTACCCCTAAAAAATAAAAAAAAAAAAAA

AGGATGC Translation initiation motif  
ATC Translation initiation codon  
TGA Translation termination codon  
AATAAA Polyadenylation signal

The nucleotide sequences of the ESTs R25718 and F06569 are in brackets and underlined, respectively.

FIG. 1-2

ABCB9 amino acid sequence

MRLWKAVVVTLAFMSVDICVTTAIYVFSHLDRSLLEDIRHFNIFDSVLDLWAACLYRSCLLLGATIGVAKNSALGPRRLRASWLIVITLVCLFVGIY  
AMVKLLLFSEVRRPIRDPWFALFVWTYISLGASFLLWLLSTVRPGTQALEPGAATEAEGFPGSGRPPPEQASGATLQKLLSYTKPDVAFIVAAS  
FFLIVAALGETFLPYYTGRAIDGIVIQKSMQDFSTAVVIVCLLAIGSSFAAGIRGGIFTLLIFARLNIRLNRCLFRSLVSQETSFDDENRTGDLISR  
LTSDTTMVSDLVSQININFLRNTVKVTGVVFMFSLSWQLSLVTFMGFPIIMMVSNIYKYYKRLSKEVQNALARASNTAEETISAMKTVRSFANE  
EEEEAEVYLRKLQQVYKLNKRAAAAYMYVVGSGGLTLLVVQVSILYYGGHLVISGQMTSGNLIAFIIYEFVLGDCMESVGSVYSGLMQGVGAAEKVF  
EFIDRQPTMVHDGSLAPDHLEGRVDFENVTFYTRPHTQVLQNVFSLSPGKVTAALVGPSSGKSSCVNILENFYPLEGGRVLLDGKPI SAYDHK  
YLHRVISLVSQEPVLFARSITDNI SYGLPTVPFEMVVEAAQKANAHGFIMELQDGYSTETGEKGAQLSGGQKQORVAMARALVRNPPVLILDEATSA  
LDAESEYLIQQAIGHNLQKHTVLIIAHRLSTVEHAHLIVVLDKGRVVQQGTHQQLLAQGGLYAKLVQRQMLGLQPAADFTAGHNEPVANGSHKA

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<u>GPSGSGKSS</u>	Walker A
<u>LSGGQKQORVAMA</u>	ABC transporter signature
<u>RALVRNPPVLILDEAT</u>	Walker B

FIG. 2

8 Sequences Aligned. Alignment Score = 59218  
Gaps Inserted = 53 Conserved Identities = 149

Pairwise Alignment Mode: Slow  
Pairwise Alignment Parameters:  
Open Gap Penalty = 10.0   Extend Gap Penalty = 0.1  
Similarity Matrix: blosum

Multiple Alignment Parameters:  
Open Gap Penalty = 10.0   Extend Gap Penalty = 0.1  
Delay Divergent = 40%   Gap Distance = 8  
Similarity Matrix: blosum

[illegible]

Accession	Protein	Sequence	Length
ABC89	Mouse TAP1	83 WLVTITLVCFLVGIYAMWKL... 83 WLVTITLVCFLVGIYAMWKL... 101 AALGLALPGLALFRELISW... 77 AALSALPGLALFRELAAWGT... 78 AALGLALPGLASFRLKSAW... 67 LPLCLATPLTVSLRALVAG... 67 PLLCLATPLFFSLRALVGG... 67 PLLCLTNPLFFSLRALVGS...	180 176 179 155 156 144 143 144
ABC82	Mouse TAP1	83 WLVTITLVCFLVGIYAMWKL... 83 WLVTITLVCFLVGIYAMWKL... 101 AALGLALPGLALFRELISW... 77 AALSALPGLALFRELAAWGT... 78 AALGLALPGLASFRLKSAW... 67 LPLCLATPLTVSLRALVAG... 67 PLLCLATPLFFSLRALVGG... 67 PLLCLTNPLFFSLRALVGS...	180 176 179 155 156 144 143 144
ABC83	Mouse TAP2	83 WLVTITLVCFLVGIYAMWKL... 83 WLVTITLVCFLVGIYAMWKL... 101 AALGLALPGLALFRELISW... 77 AALSALPGLALFRELAAWGT... 78 AALGLALPGLASFRLKSAW... 67 LPLCLATPLTVSLRALVAG... 67 PLLCLATPLFFSLRALVGG... 67 PLLCLTNPLFFSLRALVGS...	180 176 179 155 156 144 143 144
ABC84	Rat TAP2	83 WLVTITLVCFLVGIYAMWKL... 83 WLVTITLVCFLVGIYAMWKL... 101 AALGLALPGLALFRELISW... 77 AALSALPGLALFRELAAWGT... 78 AALGLALPGLASFRLKSAW... 67 LPLCLATPLTVSLRALVAG... 67 PLLCLATPLFFSLRALVGG... 67 PLLCLTNPLFFSLRALVGS...	180 176 179 155 156 144 143 144

FIG. 3-1

FIG. 3-2

Accession	Protein	Gene	Species	Length (aa)	MD5	Accession	Protein	Gene	Species	Length (aa)	MD5
AABC89	rat TAP1	TAP1	Rattus norvegicus	580	EFIDRQPTMWDGSLAPDHL	EGRVDFENVFTYTRTPHTQVLQNVFSLS	SPGKVTALVPGSGSGKSSCWNILENFYPLEGGRVLLDGKPI	SAYDHYL	580		
AABC82	Mouse TAP1	TAP1	Mus musculus	576	EFIDRQPTMWDGRLAPDHL	EGRVDFENVFTYTRTPHTQVLQNVFSLS	SPGKVTALVPGSGSGKSSCWNILENFYPLQGRRVLLDGEPI	GAYDHYL	576		
Mouse TAP1	Mouse TAP1	TAP1	Mouse	579	EYLDRTPCPPSGLL	TPLEGLVQFDVSFAYPNRPDVLVQLG	FTFLRPEVTALVPGNSGKSTVAALLQNL	YQPTGGQLLDGKPL	579		
Mouse TAP1	Mouse TAP1	TAP1	Mouse	555	EYLDRTPCPL	SSGLAPSNNKGLVEFQDVSFAYPNQKVVQLG	FTFLHPGTVTALVPGNSGKSTVAALLQNL	YQPTGGQLLDGRL	555		
Rat TAP1	Rat TAP1	TAP1	Rattus norvegicus	556	EYLDRTPCPL	SSGLAPLNMKGLVKFQDVSFAYPNHPNVQVLG	FTFLYPGKVTALVPGNSGKSTVAALLQNL	YQPTGGKVL	556		
AABC83	Mouse TAP2	TAP2	Mouse	544	SYMDRQPNL	PSPGTAPTTLQGWKFDVSFAYPNRPDRPVLKGL	FTFLRPEVTALVPGNSGKSTVAALLQNL	YQPTGGVLLDEKPI	544		
Mouse TAP2	Mouse TAP2	TAP2	Mouse	543	SYLDKPNL	PQPGILAPPWL	EGRVEFQDVSFYPRRPEKPVQLG	FTFLHPGTVTALVPGNSGKSTVAALLQNL	YQPTGGQLLDGEPL	543	
Rat TAP2	Rat TAP2	TAP2	Rattus norvegicus	544	SYLDRPNL	PNPGTLAPPRLEGRVEFQDVSFYSPRPEKPVQLG	FTFLHPGKVTALVPGNSGKSTVAALLQNL	YQPTGGQLLDGEPL	544		

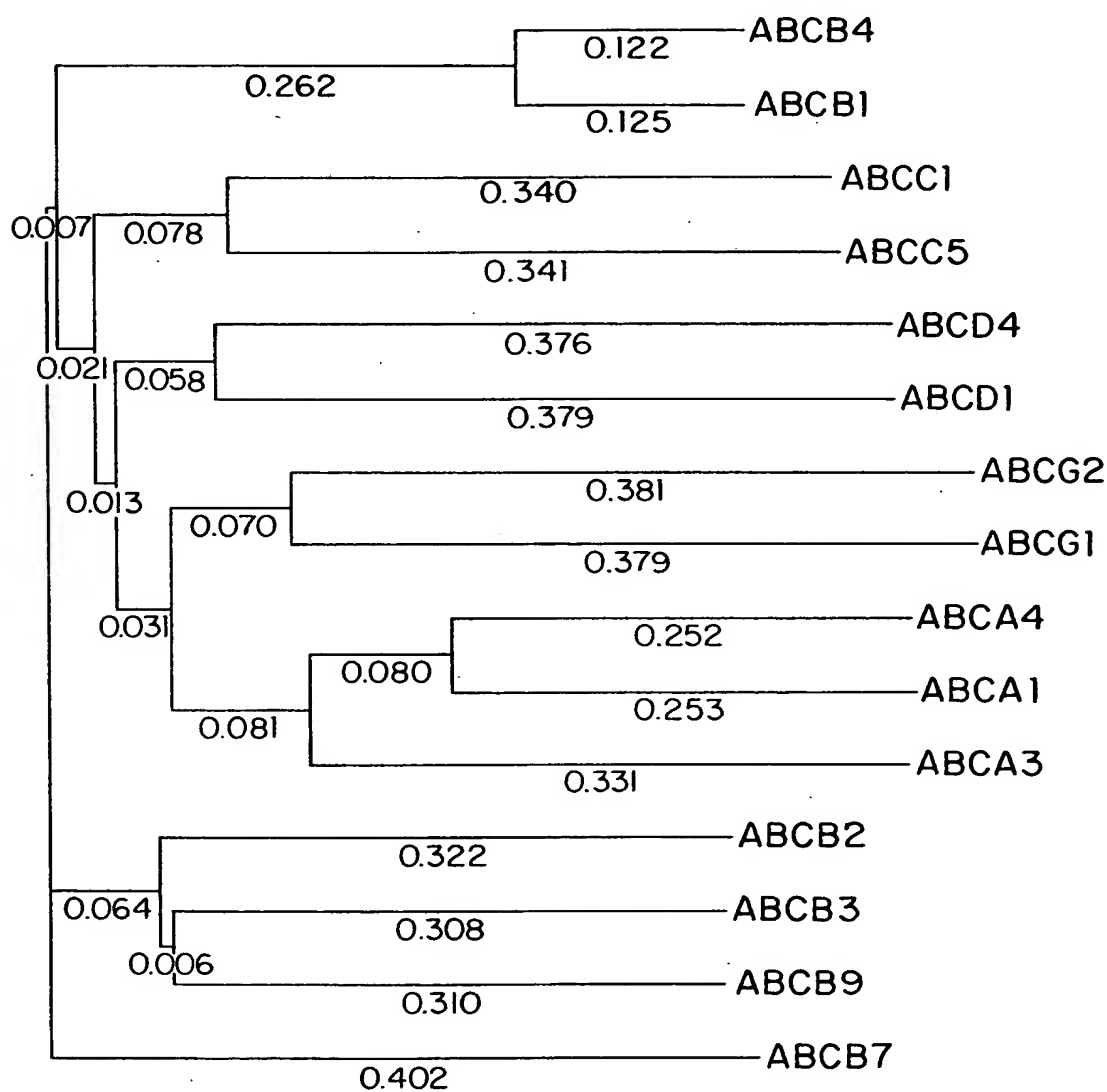
[illegible]

ABCB9	680	L IQQAIHGN--LQKHTVLI IAHR LSTVEHAHL IVVLDKGRVQGGTHQQLAQGGL YAKL VQRQMLGLQPAADFTAGHNIEPVANGSHKA	766
rat TAP1	676	L IQQAIHGN--LQRHTVLI IAHR LSTVERAHL IVVLDKGRVQGGTHQQLAQGGL YAKL VQRQMLGLEHPLDYTAGHKPEPPSNIHKA	762
ABCB2	680	QVEQLL YESPERYSRVLL ITQHL SLVEQADHILFLEGGAIREGGTHQQLMEKKGCYAMVQAPADAPE	746
Mouse TAP1	656	RVQRLL YESPKRASRTVLL ITQQL SLAEQAHHILFLREGSVGEQTHLQLMKRGCCYRAMVEALAAPAD	724
Rat TAP1	657	RVQRLL YESPEWASRTVLL ITQQL SLAERAHHILFLKEGSVCEQTHLQLMERGGCYRSMVEALAAPSD	725
ABCB3	644	ALQDWN-----RGORTVLVIAHRLQTVQRAHQILVLQEG---KLQKLAQL	686
Mouse TAP2	643	ALQNWRS-----QGORTMLVIAHRLHTVQNADQVLVLKQG---RLVEHQDLRDGQDVYVAHLVQQRLEA	702
Rat TAP2	644	ALQTWRS-----QEDRTMLVIAHRLHTVQNADQVLVLKQG---QLVEHQDLRDEQDVYVAHLVQQRLEA	703

FIG. 3-3

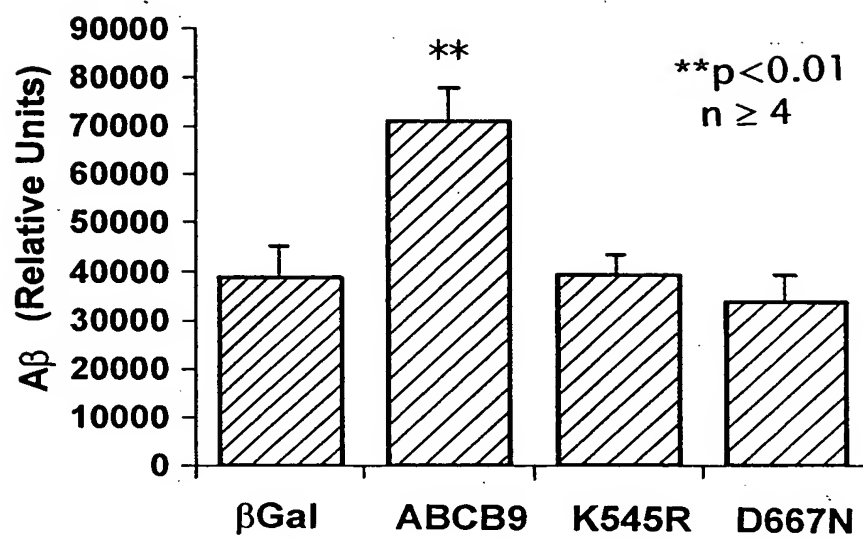
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Phenogram of some ABC transporter proteins



**FIG. 4**

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**FIG. 5**